

News Briefs . . . . .	2	Let's Work Together . . . . .	3
Special Events Calendar . . . . .	2	Service Awards . . . . .	3
Aura Instruments Up to the Test . . . . .	2	Passings, Classifieds . . . . .	4

## Rover science team gets ready

By Mary Hardin

*The Fido rover, above at a secret desert location for 10 days of field tests in August. Below are science team members Dr. Eddie Tunstel (left), the rover's lead engineer, and engineer Ashitey Trebi-Ollennu, who worked on*



Photo by Bob Brown / JPL Photolab

*With less than a year* to go before the launch of JPL's Mars Exploration Rover mission, scientists have spent the last few weeks at a high-tech summer camp, rehearsing their roles for when the spacecraft take center stage.

"The purpose of this test is really to teach the science team how to remotely conduct field geology using a rover, rather than to test the rover hardware," said Dr. John Callas, science manager for the Mars Exploration Rover mission at JPL. "We sent one of our engineering development rovers out to a distant, undisclosed desert location, with the science team back at JPL planning the operations and sending commands, just as they'll do when the actual rovers are on Mars."

The 10-day blind test, which ran from Aug. 10 to 19, used the Field Integrated Design Operations testbed, called Fido, which is similar in size and capability to the Mars Exploration Rovers. Although important differences exist, the similarities are great enough that the same types of challenges exist in commanding these rovers in complex realistic terrain as are expected for the rovers on Mars.

"The scientific instruments on this test rover are similar to the Athena science payload that will be carried by the Mars Exploration Rovers," said Dr. Steve Squyres, principal investigator for the Mars Exploration Rover mission at Cornell University, Ithaca, N.Y. "We're using the test rover now to learn how to do good field geology with a robot. When we get to real Mars rover operations in 2004, we'll be

able to use everything we're learning now to maximize our science return."

"The test rover has received and executed daily commands via satellite communications between JPL and the remote desert field site," said Dr. Eddie Tunstel, the rover's lead engineer at JPL. Each day, they have sent images and science data to JPL that reveal properties of the desert geology."

The Mars Exploration Rovers will be launched in May and June 2003. Upon their arrival at Mars in January 2004, they will spend at least three months conducting surface operations, exploring Mars for evidence of past water interaction with the surface and looking for other clues to the planet's past.

The science team of more than 60 scientists from around the world will tell the rovers what to do and where to go from the mission control room at JPL. The August test is one of several training operations that are planned before landing.

The rovers are currently being built at JPL and will be shipped to the Kennedy Space Center in Florida early next year to begin preparations for launch. Shortly before the launch, NASA will select the landing sites.

More information about the mission is available online at [http://www.jpl.nasa.gov/news/fact\\_sheets/mars03rovers.pdf](http://www.jpl.nasa.gov/news/fact_sheets/mars03rovers.pdf) or <http://mars.jpl.nasa.gov/mer>.

A description of the Fido rover is available at <http://fido.jpl.nasa.gov>.

For more information about the Mars Exploration Program, log on to <http://mars.jpl.nasa.gov>.



Photo by Durch Slager / JPL Photolab

## Family Day set for Sept. 21

Family members of JPL employees and contractors will have a unique opportunity to get a close-up view of the Laboratory and its activities during JPL Family Day, scheduled for Saturday, Sept. 21.

The event will be held from 10 a.m. to 3 p.m. Tickets are required for JPL staff and their guests, and will be available from Sept. 3–13 at the following locations:

- JPL Store (Building 114-104)
- Credit union (218)
- Employee Services and Recognition (310-203)
- Public Services (186-113)
- Mechanical prototype and hardware fabrication (170-115C)
- Mars Exploration Program (T1722-146)
- Human Resources (180-200).

"Family Day is a great way for JPL families to see where and how work gets done on Lab, something they normally can't do when they visit," said Nancy Kapell of the Employee Services and Recognition Office.

Astronaut Dr. John Grunsfeld will give 25-minute presentations in von Kármán Auditorium starting at 10 a.m. The multimedia presentation "Welcome to Outer Space" will be shown in von Kármán every half hour starting at 1 p.m.

Additional presentations will be offered by the Mars Exploration Program (Buildings 303, 317, 179), Mechanical Prototype and Hardware Fabrication (170), Space Flight Operations Facility (230), Regional Planetary Image Facility (202), Solar System Ambassadors (167), von Kármán visitor center (186) and Telescopes In Education (near credit union, Building 218).

In addition, the Child Educational Center will offer children's activities on the mall; the credit union will be open on the mall to offer new accounts to JPL family members; and the JPL Store will be open for JPL and NASA souvenirs.

Free lunch will be served on the mall from 10:30 a.m. to 2:30 p.m. The menu will include hamburgers, hot dogs, a variety of sandwiches, ice cream, snacks and beverages.

JPL staff must wear their JPL picture badge and must escort their family at all times. Parking is available in the West Lot and Blue Lot only. Staff and their families will bring their tickets to Guest Services on the mall for registration, at which point they will be provided with an event program and lunch ticket.

For more information, call Kapell at ext. 4-9432.



# News Briefs

## TPF study contracts awarded

NASA has awarded contracts to four companies to study how to build a primary mirror for a coronagraph, one of two possible mission architectures for the planned Terrestrial Planet Finder mission, managed by JPL. The two architectures would use different means to block light from a parent star in order to see the much smaller, dimmer planets that may be orbiting it.

A large optical telescope with a coronagraph is one possible architecture. The system would collect starlight and the very dim reflected light from orbiting planets. This would enable astronomers to detect and obtain spectral information from the planet. The coronagraph and special optics help to reduce the visible starlight, which is typically more than 1 billion times more intense than the reflected light from the planet.

The four companies, each receiving a \$250,000 contract, are Eastman Kodak, Commercial and Government Systems., Rochester, N.Y.; Goodrich Corp., Optical and Space Systems Division, Danbury, Conn.; Brashear LP, Pittsburgh; and SSG Precision Optronics, Inc., Wilmington, Mass., with its subsidiary, Tinsley Division, Richmond, Calif.

NASA plans to select one or more mirror concepts in December, and the designated company or companies will then build and test the mirror. The outcome of that process will help NASA decide whether to use the coronagraph as the final mission architecture for the Terrestrial Planet Finder.

The alternative to the coronagraph would be an infrared interferometer, where multiple small telescopes on a fixed structure or on separated spacecraft flying in precision formation would simulate a much larger, more powerful telescope, reducing the starlight by a factor of 1 million, thus enabling the detection of the very dim infrared emission from the planets.

Other mission goals would include characterizing the surfaces and atmospheres of newfound planets, and looking for the chemical signatures of life.

The mission may launch by the middle of the next decade. For more information, visit <http://tpf.jpl.nasa.gov>.

## Future planetary scientists visit

Two groups of students spent a week each on Lab in August to participate in the Planetary Science Summer School for future planetary scientists and principal investigators.

Thirty-six Ph.D. students and post-docs participated in team activities to gain insight into developing a mission proposal using the JPL Project Design Center.

Both groups spent time designing mock missions to Mars. The first group designed a scout mission they named the Mars Atmospheric Boundary Layer Explorer. The other group took on an ambitious lander mission, the Mars Water Analysis & Local Radar Underground Survey. At the end of the week both groups presented their proposals to a panel of JPL scientists and engineers for feedback.

The NASA Planetary Science Summer School was started in 1989 by JPL's NEIL NICKLE at the request of DR. JURGEN RAHE of NASA's Office of Space Science. "The first 10 years were a lecture format, but then one of our advisors, DR. JIM HEAD of Brown University, suggested we provide a 'boot camp' for future planetary scientists, an immersion in things it took him a career to learn about planetary missions," said task manager ANITA SOHUS. The response has been tremendous."

Attendees noted that the Caltech and JPL speakers and staff were inspiring, extremely helpful and a great source of information. Some also said the experience helped put their work in perspective and gave them a sense of "the big picture." Their only complaint was that a week was not nearly long enough.

The Planetary Science Summer School was organized by Sohus and ROBERT GERSHMAN.

## Sign up now for September fitness

The next six-week session of fitness classes at JPL's Wellness Place is set to begin on Sept. 9. Classes offered are yoga (including advanced), Tai Chi (including mini-sessions), pilates, and aerobics (ultimate gluts and abs, body sculpting and kickboxing).

Visit the Wellness Place website at <http://eis.jpl.nasa.gov/hr/esr/wellness/schedule.htm> for class schedule and registration procedures.

# Special Events Calendar

## Ongoing Support Groups

**Alcoholics Anonymous**—Meetings are available. Call the Employee Assistance Program at ext. 4-3680 for time and location.

**Caregivers Support Group**—Meets the first Thursday of the month at noon in Building 167-111 (The Wellness Place). For more information, call the Employee Assistance Program at ext. 4-3680.

**Codependents Anonymous**—Meeting at noon every Wednesday. For more information, call Occupational Health Services at ext. 4-3319.

**Gay, Lesbian and Bisexual Group**—Meets the first and third Fridays of the month at noon in Building 111-117. For more information, call the Employee Assistance Program at ext. 4-3680 or Randy Herrera at ext. 3-0664.

**Working Parents Support Group**—Meets the third Thursday of the month at noon in Building 167-111 (The Wellness Place). For more information, call the Employee Assistance Program at ext. 4-3680.

## Tuesday, September 3

**JPL Gamers Club**—Meeting at noon in Building 301-227.

**JPL Genealogy Club**—Meeting at noon in Building 301-271.

**Music on the Mall**—JPL's Ka-Band will perform three selections from the Voyager "Golden Record." Guest speakers Robert Picardo and Patrick Stewart from the Star Trek TV series will also appear. Festivities will be held from 11:30 a.m. to 1 p.m.

## Wednesday, September 4

**Associated Retirees of JPL/Caltech**—Meeting at 10 a.m. at the Caltech Credit Union, 528 Foothill Blvd., La Cañada.

**Voyager Movie**—A new movie with Voyager highlights will be played from 11:45 a.m. to 1:30 p.m. in von Kármán Auditorium. Voyager anniversary cake and punch will be provided for attendees.

## Thursday, September 5

**JPL Gun Club**—Meeting at noon in Building 183-328.

**Voyager Stories and Discussion**—Key players in the history of the Voyager mission will comprise a panel discussion from 11:30 a.m. to 1 p.m.

Speakers include Bud Schurmeier, pre-launch project manager (1972–76); Ray Heacock, spacecraft systems manager (1972–79) and deputy project manager (1978–81); John Casani, project manager (1976–78); Charley Kohlhasse, mission design manager



Bud Schurmeier

(1975–89); Dave Linick, sequence team chief (1975–79); Ellis Miner, assistant project scientist (1978–90); and George Textor, project manager/mission director (1989–97).

## Thurs.–Fri., Sept. 5–6

**IEEE/JPL Workshop**—JPL's Deep Space Communications and Navigation Systems Center of Excellence sponsors this two-day event on wireless communications and networking at the Doubletree Hotel in Pasadena. The meeting's emphasis is on power-efficient wireless ad hoc networks. JPL Director Dr. Charles Elachi will open the meeting with welcome and opening remarks. The agenda includes keynote speakers Dr. Andrew Viterbi, Qualcomm co-founder, and UCLA Prof. Deborah Estrin; a discussion featuring industrial panelists; and education outreach opportunities for local universities, including Caltech, UCLA and USC. See the full program and registration details at <http://dsp.jpl.nasa.gov/cas>. Fees are \$250 for IEEE members, \$300 for non-members, and \$125 for students. For more information, call Marvin Simon, ext.4-3955 or Tsun-Yee Yan, 4-3016.

**Von Kármán Lecture Series**—Dr. Ed Stone, Caltech physics professor and retired JPL director, will present "Voyager's Exploration of the Outer Solar System" at Thursday in von Kármán Auditorium



Dr. Ed Stone

and Friday at Pasadena City College's Vosloh Forum, 1570 E. Colorado Blvd. Both lectures begin at 7 p.m. The Voyager project scientist will discuss the twin Voyagers' exploration of Jupiter, Saturn, Uranus, and Neptune, which revealed distinctive worlds with many surprises. For more information, see <http://www.jpl.nasa.gov/events/lectures/sep02a.html> or call Public Services at ext. 4-0112.

## Friday, September 6

**Folk Music**—The Scottish quintet Old Blind Dogs will appear at 8 p.m. in Caltech's Dabney Lounge. Tickets are \$15 for adults and \$5 for children under 12. For more information, call (626) 395-4652 or check the Folk Music Society web site at <http://www.cco.caltech.edu/~folkmusi>.

## Tuesday, September 10

**JPL Stamp Club**—Meeting at noon in Building 183-328.

## Wednesday, September 11

**JPL Amateur Radio Club**—Meeting at noon in Building 238-543.

**JPL Toastmasters Club**—Meeting at 5 p.m. in the 167 conference room. Call Roger Carlson at ext. 4-2295 for information.

## ALSO SEE LISTING BELOW.

# Lab's Aura instruments up to the test



Photo courtesy of Kirk Seaman



Photo courtesy of Dennis Flower

*Two JPL instruments that will fly onboard NASA's Earth-orbiting Aura spacecraft underwent environmental testing in August, the first time two instruments on one mission were tested at the same time. Above, technician Chuck Foehlinger checks out the Tropospheric Emission Spectrometer during thermal balance and system level tests in Building 306. At left, instrumentation engineer Doug Perry and thermal engineer Eug-Yun Kwack work on the Microwave Limb Sounder's system thermal vacuum tests in Building 248. Aura is scheduled for launch in January 2004.*

# Lab to remember Sept. 11

Flags at JPL will be flown at half-staff on Wednesday, Sept. 11, as the Lab will observe the one-year anniversary of the terrorist attacks on the United States.

JPL will broadcast a memorial from NASA Headquarters, scheduled to air from 7:20 to 8 a.m. Pacific time on Channel 39 of the Lab's TV monitors. This will include an agency-wide moment of silence at 7:29. In addition, a JPL honor guard comprised of the Lab's security guards and firefighters engine will be present on the mall. A JPL fire engine and security car will be in place to commemorate first responders to the Sept. 11 attacks. A moment of silence will be observed at noon.

Staff members may visit von Kármán Auditorium any time during the day for periods of silent reflection.

Anyone who feels the need to speak with a counselor is welcome to call the Employee Assistance Program at ext. 4-3680.



# LET'S WORK TOGETHER

*JPL, Marshall Space Flight Center seal collaboration deal, one of a number of agreements the Laboratory has throughout the agency*

By Mark Whalen

A RECENTLY SIGNED COLLABORATIVE AGREEMENT between JPL and NASA's Marshall Space Flight Center is the fourth such alliance JPL has forged with other NASA centers in the past 15 months.

JPL Director Dr. Charles Elachi joined Marshall Director Arthur Stephenson in signing the agreement in early August. The objective is to build an interdependent relationship for infusing Marshall's research and technology development capabilities into JPL's Space and Earth Science flight missions.

Also participating in the signing at the Huntsville, Ala. center were Leslie Livesay, manager of the Avionic Systems and Technology Division; Phil Garrison, manager of the Mechanical Systems Engineering and Research Division; and Jack Stocky, chief technologist for the New Millennium Program.

The Lab had previously agreed to similar alliances with Ames Research Center in northern California, Glenn Research Center in Ohio and Langley Research Center in Virginia.

"We and our alliance partners in NASA can now proactively look for new initiatives in space research and development," noted JPL's Art Murphy, who manages NASA Intercenter Alliance Development.

The collaborations match the centers' expertise in their areas of "core competencies"—in JPL's case, robotic spacecraft; large apertures, interferometry, wavefront sensing and control; sensors, detectors and microdevices; and in-situ life detection—for the centers' mutual benefit. While JPL commits to having the alliance centers' personnel and technology participate in the Lab's future flight missions, the partner institutions commit to having JPL participate in early fundamental research and technology in their core technology areas.

The JPL/Marshall alliance focuses on the areas of autonomous rendezvous and docking, in-space propulsion, avionics and risk modeling. The integration of JPL's and Marshall's capabilities will provide NASA with an aligned approach to in-space transportation technologies and the development of scientific flight missions. The alliance will also incorporate JPL's expertise in unmanned guidance, navigation and control with Marshall's capabilities in rendezvous and docking systems that support human exploration. The centers also will cooperate to enable a more comprehensive assessment and understanding of the risks related to the development of new space transportation systems.

The other JPL alliances, with each center's areas of specialty, are:

- Langley: materials and structures, atmospheric flight technology, system analysis
- Ames: engineering of complex systems, mission data systems, information technology, bio-nanotechnology
- Glenn: electric power, propulsion, spacecraft communications and risk models

While there is sometimes an overlap in centers' responsibilities, "It's here where we can develop new and exciting opportunities, working as



one NASA," Murphy said. "It's planned cooperation rather than our past competition.

"JPL and the other NASA centers will in the future present to NASA headquarters joint technology program proposals."

In fact, Murphy said, JPL and Langley are developing a joint proposal to NASA and the Department of Defense for research and development of a spacecraft technology called Intronic. The alliance with Ames has resulted in that center's development of a software planning/visualization tool for the Mars Exploration Rovers once they land, and Ames has also provided significant contributions to JPL's Mission Data System activities.

JPL's alliance with Glenn Research Center is presently being directed at future electric propulsion and other fundamental propulsion system technologies.

To augment the existing agreements, plans are underway to develop new JPL alliances with Dryden Flight Research Center at Edwards Air Force Base and Stennis Research Center in Mississippi.

JPL's intercenter agreements are reviewed about every six months by Elachi or Deputy Director Eugene Tattini. "It's almost like a review of a major mission or project," Murphy said. He added that JPL technical leaders who have signed "sub-agreements" to aid in carrying out the alliances also report achievement milestones to Elachi every six months.

*This story was adapted in part from an article in Marshall Space Flight Center's Marshall Star. Thanks to writer Lynnette Madison and editor Jonathan Baggs.*

*Marshall Space Flight Center Director Art Stephenson, left, and JPL Director Dr. Charles Elachi sign an alliance agreement between the two centers.*

## Service awards

*The following JPL 2002 third quarter Service Award recipients celebrating 20 or more years of service were invited to attend a luncheon and ceremony in their honor on Sept. 20.*

**45 years:** John Casani, Jay Schmuecker.

**40 years:** John Beedy, Arvydas Kliore, Gary Kunstmann, Richard Parker, Frederick Stuhr, Dale Thornton, Donald Wetton.



John Casani

**35 years:** Bruce Conroy, James Miller, Ellis Miner, Richard Nonaka, John Rohr, W. Van Snyder, James Stultz, David Swenson, William Weber III.

**30 years:** Camille Hayes, George Purcell Jr., E.M. Standish Jr., Bruce Tsurutani, Kathleen Ulrich, Gene Wester, Chen-Wan Yen.

**25 years:** Robert Barry, William Blume, James Collier, Minoo Dastoor, Govind Deshpande, Jean Dickey, Robert Easter, Martha Hanner, Satish Khanna, Bruce McLaughlin, Larry Preheim, Ronald Reeve, Annie Richardson, Eddy Shalom, Robert Staehle, Jan Tarsala, Catherine Yee, Jose Zavala.

**20 years:** Susan Argenio, Michael Blakely, David Brinza, Magdi Carlton, Michael Coryell, James Dillon, Carolina Flores-Helizon, Frank



Kuykendall, Robert Laskin, Roger Lighty, Farzin Manshadi, Richard W. Markley, Laurence Reinhart, Jerry Sutor, Arthur Thompson, Robert Treuhaft, Duc Vu, Leslie White, Brian Wilcox.



# Calling all Mariner 2 team members

DailyPlanet

online for the JPL community

Classified ads will be available the day before Universe is published, at

http://dailyplanet

JPL's online news source

View this and previous issues of Universe online  
http://universe.jpl.nasa.gov

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**Notice to Advertisers**  
Advertising is available for JPL and Caltech employees, contractors and retirees and their families. No more than two ads of up to 60 words each will be published for each advertiser. Items may be combined within one submission. Ads must be submitted on ad cards, available at the JPL Store and the Universe office, Bldg. 186-118, or via e-mail to universe@jpl.nasa.gov. Ads are due at 2 p.m. on the Monday after publication for the following issue.  
All housing and vehicle advertisements require that the qualifying person(s) placing the ad be listed as an owner on the ownership documents.

The Public Services Office is trying to locate members of the Mariner 2 project for a special JPL event in December.  
Mariner 2, the first spacecraft to fly by another planet, launched in August 1962 and flew by Venus on Dec. 14 of that year. The JPL event will commemorate the Venus encounter.  
What was once merely speculation about distant planets was verified by Mariner 2's abundant science return. Mariner 2 carried six instruments, including a microwave radiometer, an infrared radiometer and a cosmic dust detector. In addition to being the first spacecraft to cruise interplanetary space, it also measured solar wind for the first time. This elusive stream of charged particles emanating from the Sun could hold keys to the formation of the universe.  
Mariner 2 team members are asked to call Public Services at (818) 354-0112.

## Classifieds

### For Sale

BABY ITEMS: soft front carrier, Evenflo, \$7; car seat w/base, Century, rear-facing, \$40; bathtub carrousel, Safety1st, \$7, all in superb cond., prices are obo. 626/791-6101.  
BABY TOYS, Activity Garden, Little Tykes, includes plastic vegetables, mail and mailbox, birds, and some flowers on the side, for 6m - 2y, \$25/obo; Angel Fish Rocker, very cute, yellow, \$15; Little Smart Peek-a-Boo Apple Acres, by VTech Electronic, new, \$10/obo; Alphabet Apple, by VTech, ages 3-5 years, for learning the ABCs and phonics, \$9/obo; Nursery Rhyme, 6m-2y, \$10/obo. 952-0328.  
BARBECUE, gas, high quality, gd. cond., \$50. 790-7372.  
BBQ, gas, incl. 5-gal. tank. \$20/obo; BASKET-BALL HOOP, backboard & mount for wall/ garage, \$15/obo; both items gd. cond. 626/791-7645.  
BED, king, solid wood bed frame w/nightstand, vg cond., picture avail., must see, \$600/obo; MATTRESS, vg quality, king, \$500/obo; PIANO, upright, quite old but in gd cond., \$500/obo. 626/584-1164.  
BELLY DANCE COSTUMES, sparkly nightclub styles, med. sizes; black/multicolor, \$500; pink/black \$400; purple/silver, \$375. 323/258-7037.  
CAMCORDER, Sony Hi-8, model CCD-TR81, remote, carry case, 8 blank tapes, works well, \$155/obo. 687-8627.  
CAMERA, Mamiya M645 SLR, A & E prism, 220 back, w/120 & 220 roll film holders & inserts, deluxe power motor dr. lenses, 45 mm, 80 mm & 105-210 zoom, Sunpak auto flash, mod. 555, alum. case, \$2,000. 323/257-7668.  
CATAMARAN, Hobie 16, 1982, exc. cond., would like to share the use with a person or group willing to provide parking or share the cost of storage. 323/227-7799 or martin\_regehr@yahoo.com, Martin.  
CHAIRS, 2, patio lounge, beige vinyl straps, exc. cond., \$25/both. 626/359-7666.  
CHILDREN'S ITEMS: rocking horse, antique, hand-made, walnut, 40" tall, \$70; highchair, walnut, perfect cond., will negotiate, \$40. 323/469-2816.  
CRIB, beautiful wood, w/Sealy mattress, exc. cond., \$100. 790-7372.  
COFFEE MAKERS: Krups, 10-cups, white/gray, like new, \$40/obo; Braun, 10-cups, white/black, like new, \$30/obo. 626/791-6101.  
CURIO, Italian imported, black lacquer, 3 x 8 ft., glass double door, beautiful, elegant, exc. cond., \$650. 323/256-0535.  
DINING TABLE, beautiful Italian imported lacquer, 6.8 ft. long, enlarges to 8 ft., w/elegant high-back chairs (white upholstery) in exc. cond., complete set \$1,400. 323/256-0535.  
DRYER, Kenmore, heavy duty, gas, 4 cycles, 8 temperatures, good cond., \$100/obo. 626/797-9846, after 6 p.m.  
ENTERTAINMENT CENTER, Ikea, holds 32" TV, VCR, stereo and more, \$80/obo; CD TOWER, holds 350 CDs, \$30/obo. 626/791-8161.  
FAUCETS, one kitchen, two bathroom (one single handle, one double handles), all in like-new cond.; DRAWER/CABINET PULLS, chrome, never used. 626/296-1537, Ed.  
FISH TANK, 60 gal. w/ stand and hood, fresh water, filters, pumps, gravel, heater, plants, etc, \$120/all. 353-4400.  
FURNITURE: loveseat and ottoman, \$350; loveseat, Italian leather, \$450; dining set, corner nook, \$350, sell separately or all for \$1,000/obo. dbljo7@yahoo.com or 626/535-9645, Jo Anne.  
KITCHEN DOORS, 2, from So. Pas. mansion, solid wood, elaborate decoration, beveled glass, no finish on wood, \$1,200 obo. 626/287-9433.  
MEAT SLICER, electric, like new,\$20/obo; EXERCISER, Fitness Flyer, no impact, displays elapsed time, calories and count of repetitions, like new, \$100/obo. 249-8079.  
MOVING SALE: chair, elegant, Queen Anne, overstuffed; loveseat, burg., velvet; coffee table, beautiful, octagonal, marble; end tables, walnut tables; exercise bike, Health-rider; electric typewriter, portable, full-sized, Smith-Corona; all exc. cond.; priced to sell; will negotiate. 323/469-2816.  
PLAY EQUIPMENT, outdoor, Little Tikes, Castle Climbing Structure with tower and slide, \$80; small slide, \$15; Cozy Coupe Car, \$25; desk w/chair and compartment storage, \$45. 626/797-9846, after 6 p.m.  
PIANO, Clavinova digital, Yamaha CLP 411, exc. cond., black, with bench, \$1,200/obo. 626/475-5790.  
PIANO, upright, quite old but in good cond., \$500/obo. 626/584-1164.  
PLATES, 20-25, porcelain, collectible, \$75/ set; LOUNGE CHAIRS, 2, beige, vinyl, strapped, exc. cond., \$20/both; BIKES, 2, exc. cond., 1 boy's, 1 girl's, \$15/ea. 626/359-7666.  
PLAYSET, Step 2, child slide and swing combo, \$125. 790-7600.  
SCANNER, brand new, Visioneer OneTouch 5800 USB 48-bit color, 600 x 1200 dpi, supports Windows 98/2000/Millennium/XP,

\$40. 956-3745, Steve.  
SKI SET, used women's Head 170s Gala radial & poles, Salomon boots, size 7 and bindings, see picture at JPL Store, \$80. 626/744-9064.  
SOFA, makes into queen-size bed, abstract black, blue & mauve design, gd. cond., \$300; LADDER, \$50; REFRIGERATOR, GE side-by-side, beige, 17 years old, \$75. 626/357-8210.  
SOFA, gd cond., black, blue, mauve, gold; std. sz.; \$200; DINETTE TABLE, glass circular top, 40" diam., wood base; REFRIGERATOR, 18 cu. ft., Frigidaire Crown, exc. cond., white, top freezer, auto defrost, \$300; CHAIRS, 4, \$60. 323/478-0105.  
SOFA, sectional, beige, very comfortable, matching pillows, \$200/obo; DINING TABLE SET, dk. brown wood w/forest green trim, very nice, comes w/6 chairs, \$200/obo. 952-0328.  
VACATION CLUB MEMBERSHIP, Silverlakes, Calif., resort, golfer's dream, 4 weeks free golf anytime each year at private PGA-rated course w/driving range and putting greens, 2 bd. condo for up to 6 people, 2 lakes, many amenities, less than 2 hrs from Pasadena, ex-change rights with 3,000 resorts, reduced to sell due to illness, \$15,000. 805/967-7725.  
VIOLIN, Suzuki, 1/2 size, w/case, gd. cond., \$350. 248-4551.

### Vehicles / Accessories

'95 ACURA Integra "Special Edition," black, 4 door, w/body kit, 18" wheels, black leather interior, 5-speed stick, a/c/heat, std. stereo, only 134,000 miles, exc. cond., picture in JPL Store, \$8,500/obo. 323/276-6778.  
'97 BMW 328i convertible, silver w/black soft top, gray leather int., 12,800 miles, in mint cond., loaded with sport package, 6-disc CD changer, dual-zone climate control & more, must see to believe, \$24,500/obo. 952-5689.  
'97 BMW 528i, dk. blue leather, 87K miles, 6 cyl., 2.8L, auto, rear wheel drive, premium pkg. a/c, p/s, c/c, 4-wheel ABS, tilt wheel, alarm, traction control, alloy wheels, sunroof, like new, Kelley Blue Book price \$24,775, now \$18,500. 626/222-8864.  
'95 CHEVROLET Camaro, silver, T-tops, V6, 5-speed manual, 80K miles, exc. cond., \$8,000. 352-2380.  
'94 CHEVROLET Astro cargo van, V6, auto trans, a/c, p/s, p/b, airbags, ABS, am/fm stereo, cust. whls, exc. cond., new paint, tires, shocks & brakes, Cargo King bedliner, all records, 125K mi., \$5,000/obo. http://www.stonehillnews.com/astro, astro@stonehillnews.com, 626/399-6276, Jeremiah.  
'81 CHEVROLET Corvette coupe, silver over charcoal/black interior, glass tops, rare 4-spd, a/c, pwr. brakes/windows/door locks/steering, 6-way pwr. driver's seat, alloy wheels, \$4,200. 661/299-4999, Michael.  
'99 FORD F-250 Lariat, super-duty crew-cab pickup, 4 dr., 2 w/d, tow pkg., loaded, 5.4L V8, 37,500 mi., dk. green, custom pin striping, buckskin leather interior, matching SnugTop canopy w/custom carpet kit inside, must see, \$21,500/obo. 661/424-9441, after 5 p.m.  
'99 FORD Taurus wagon, metallic silver, great family car, 12-valve V6 3.0 L engine, 80K mi., exc. cond., \$8,300/obo. 626/584-1164.  
'97 FORD Explorer XLT, only 40K mi., very clean, exc. cond., garage parked, 100% dealer servicing, am/fm/cass., new tires/brakes, \$10,500. 626/355-5631, Tim, eve. before 10 p.m.  
'94 FORD T-Bird, red, auto, pwr. steering/brakes/doors/windows/seat, tilt wheel, cruise control, AM/FM radio, cassette, new tires, alarm w/keyless entry, 1 owner, all maint. records, exc. cond., \$3,900. 909/596-8117.  
'68 FORD Mustang Classic Calif. Special GT/CS, hi-perf. 302 cid, 75K orig. mi., auto, fac. A/C, PS, AM radio, metallic gold paint, black interior, GT hood, trunk, fogs and wheels, no rust, turns heads. \$13,250/obo. 626/963-5727.  
'96 HONDA Civic LX, 4 cyl., 1.6L auto, green, 4 dr., exc. cond., a/c, power steering/windows/door locks, ABS, tilt wheel, cruise cont., dual front airbags, auto alarm, tinted windows, \$5,800. 661/252-6539.  
'93 HONDA Accord SE, 4 dr., 129K mi., automatic, leather, sunroof, dk. green/champagne, all power, new tires/breaks, am/fm/cass. stereo, Bose speakers, alarm, great cond., clean title, well maint., serviced regularly, must sell. 216-0410 or ytka98@yahoo.com.  
'01 HONDA Civic DX, 5 spd. man., air, am/fm/ stereo cass., org. paint/int., new tires, new catalytic converter, \$4,000/obo. 213/229-2980, Hunaid.  
'89 HONDA Accord LXi hatchback coupe, gray w/wine interior, a/c, pwr. windows/mirrors, am/fm/cass. stereo, 5-spd., gd commuter, 35 mpg hwy, \$2,000. 661/299-4999, Patty.  
'91 JEEP Cherokee Laredo, 2-wheel dr., 4 wheel dr. compass, temp., cruise cont., loaded, all power, \$3,000/obo. 323/256-6634.  
'91 JEEP Cherokee Laredo, 4x4, blue ext., beige interior, 149,041 mi., 4.0L straight 6, power windows/door locks/seats/mirrors, cruise cont., tinted windows, tow pkg., alarm, AM/FM CD player w/removable face and prem. sound, Smittybilt running boards, alloy wheels, 3" Rancho suspension lift w/shocks, Borla exhaust header, roof rack, new battery, very well maintained w/maint. records, see to appreciate, \$4,500/obo. 626/798-3566.  
'01 LEXUS ES300, 11,200 mi., exc. cond., all



options, 60K warrantee and 3-year interior/ exterior Auto Armor, \$31,000. 661/296-7979.  
'87 MERCEDES BENZ 300SDL, fair cond., \$5,500. 626/797-8845.  
'90 MERCURY Capri, convertible white/black top, manual transmission, 90,000 miles, \$2,000/obo. 323/662-0257, Willy/Joyce.  
'95 NISSAN Sentra, vg cond., auto, a/c, power windows/locks, am/fm/cass., silver ext., \$2,800/obo. 626/796-9098.  
'91 NISSAN Infiniti G-20, fair cond., \$2,600/obo. 957-3675.  
'67 OLDS Toronado parts: hub caps, brake drum, front wheel opening moldings, distributor cap, headlight switch, air cleaner housing, bumperette, \$75; '86 or earlier CHEVY Suburban parts: full size p/u, 454: new fuel pump, front bumper, 4 steel factory 8-lug wheels & hub caps, 3 new thermostats, mirrors, starters, alternator repair manuals and more, everything for \$150/obo. 249-8079.  
'01 TOYOTA Tacoma, w/shell, loaded, less than 7,000 miles, must sell, price negotiable. 213/413-0928, Norma.  
'96 TOYOTA Corolla DX, auto, 23K miles, power windows/locks, spoiler, a/c, exc. cond., \$5,000. 909/599-3230.  
'96 TOYOTA Corolla DX, 4 dr., 5 spd., dual air bags, a/c, am/fm/tape, CD, tilt wheel, new tires, all pwr., 137K mi., exc. cond., \$5,600/obo. 760/246-3825.  
'94 TOYOTA 4Runner, V6, 4x4, auto, loaded, champagne w/tan cloth interior, 120,000 miles, 40,000 on new engine, alloy wheels, \$10,700/obo. 242-6655.  
'94 TOYOTA Camry LE, beige, automatic, 4 dr., dual air bags, a/c, am/fm/cass., pwr. steering/locks/windows/mirrors, tilt wheel, cruise cont., exc. cond., very low mi. 47K, \$6,800. 468-6558.  
'90 TOYOTA Camry LE, V6, auto, 4 dr., 130K miles, sun/moon roof, cruise control, all power, am/fm/cass./CD, smog checked, new tires, \$3,200/obo. 310/313-0284.  
'87 TOYOTA Supra, turbo, lift back, 2 dr., straight body, new 16" tires, blown head gasket, other parts new, must sell ASAP, \$650/obo. 909/596-8117.  
'01 VOLKSWAGEN Beetle GLS, silver/black leatherette, 5 spd., pwr. locks, windows, & mirrors, cruise, alloys, AM/FM/cass., CD changer, fog lights, ABS, remote keyless entry, 10K mi., \$16,800. 626/449-0997.

### Wanted

APT. / HOUSE, 2 bd. in Pas./S.Pas./ Glendale area before Oct 1. 626/345-0241, eves.  
FITNESS STEP, for step aerobics, large Reebok or equivalent. 626/345-0681.  
GLASS SOLAR FILTER, to fit discontinued Orion 8" Deep Space Explorer reflector. 626/345-0241, eves.  
SPACE INFO./memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman.  
SQUARE DANCERS, new class starting Monday nights, Sept. 9 in Glendale, beginners and dancers who want to learn modern, Western Square Dancing, also those who want to brush up on their skills. 957-7554, Bob or 248-1772, Diane.

### Free

DUCKLINGS, white ducks, hatched Aug 4, 2002. 626/795-4537, Bob.  
FIREWOOD at house near JPL. 790-6395.  
GARAGE DOORS, barn style, must take all four. 626/287-9433.  
KITTENS, 8, adorable, healthy & friendly. 626/287-9433.  
PUPPY, 8 weeks old, Charpe mix, all black, has first set of shots. 626/287-9433.

### Lost & Found

Found: RING, 10K gold, w/stones, on Aug. 1 on 9 a.m. bus from East lot. Ext. 3-7268.

### For Rent

LA CANADA, 2 bd., 1 ba. house above Foot-hill, fireplace, beamed ceilings, cent. air/heat, washer/dryer, no pets, \$1,500, 249-9577.  
LA CANADA, private rm. w/bath in lovely home, some kitchen priv., util. pd., garage, JPLer preferred, no smoking, \$450. 952-3382.  
LA CRESCENTA house, above Foothill, 3 bd., 2 ba., 2 fp. fruit trees, fenced yard, patio, quiet cul-de-sac, easy fwy access, 10 min/JPL, \$1,950. 957-7554.  
MONTROSE, sm. studio cottage, bed., lv. rm., kitch. in one room and full ba., avail. Oct 1, very private, trees, Briggs area. 248-7499.  
PASADENA, guest house, above Eaton Cyn. golf course, beautiful setting, about 1,000 sq. ft., washer & dryer, ideal for one person with a very quiet lifestyle, \$895 plus utilities. 626/798-4056.  
PASADENA, spacious furnished condo, 2 bd., 2 ba. & office, large living/dining room with balcony, immaculate condition, centrally located, 1 mile from Caltech, available 10/1, \$2,300/neg. 626/793-1473 or 626/585-9971.  
PASADENA, elegant one-level Spanish style house south of Ritz Carlton on beautiful tree-lined st., 3 bd., 3 ba. with patio, deck, fruit

A Mariner 2 team member gives the spacecraft a final check in one of the high bays.

trees, and lots of roses, appliances and gardener included, no pets or smokers, asking \$3,700. 626/844-4670, Sandie or Mike.  
PASADENA area, 3 bd. to share, 1 rm. avail. Sept. 1, 1,950 sq. ft. apt. on Madison betw. California & Del Mar, gar. prkng incl., on-site laundry facilities, pool & Jacz., lg. shared liv. rm., bd. unfurn-ished, month to month lease, \$565 + \$800 deposit. 626/449-5882 .  
PASADENA, fully furn., townhome-style apt., 2 bd., 1.5 ba., with a/c, new carpet and flooring, small patio, laundry facility and parking, \$1,250 plus util.; PASADENA, 2 bd., 1.5 ba., apt. to share w/student, furn., a/c, laundry facility, parking, \$625 + util., both are close to Caltech & PCC, 7 mi. to JPL. 626/351-9641.  
PASADENA, spacious 2 story condo, 3 bd., 2.5 ba., prestigious community, beaut. inter., bright ktch., prof. landscape, ctrl. air & heat, close to shop., cozy l/r w/FP, end unit, frml. d/r, hdwd. flrs., immac. cond., close to schls, \$1,750. 626/396-9024.  
PASADENA apt., charming 1 bd., 1 ba., 2 blocks/ PCC, new paint, carpet, fixtures, plumbing & electrical, \$1,000 w/basic util. incl. 590-2793.  
PASADENA, walk to Lake Ave. shopping & Caltech from charming 1920s apt. w/2 bd., 2 ba., LR, DR w/fplc., office & lg. front enclosed deck area, 1,450 sq. ft., cov. parking for 2 cars, water/trash/gardener paid. 249-3602 or 626/398-8865.  
SAN GABRIEL, house to share, fully furnished 2 bd., 1 ba., no pets, utilities included, \$450. 626/292-8042.  
SAN MARINO house, 3 bd., 2 ba., 2-car gar. w/auto. gar. opener, newly painted, remodeled kitch., dishwasher, a/c, laundry hookups, spacious fam. rm. overlooking yd., liv. rm w/ fireplace, close to bus, exc. neighborhood and school district, \$2,580. 626/576-7333.  
SIERRA MADRE, townhouse-style apt. to share, large patio, 12 x 12 ft. bd., quiet tree-lined street, garage parking, no smoking, \$650 + 1/2 util. 626/355-4838.  
TEMPLE CITY, 1928 Tudor home, lease/rent, complete remodel, 2 bd., 1 ba., hdwood/ travertine flrs, 2 decks, lg yard, office, loft, bonus room & more. 626/287-9433.  
TEMPLE CITY, rear home lease or rent, complete remodel, 1 bd., 1 ba., ceramic tile/Berber flooring, huge patio, auto gate for parking & more. 626/287-9433.

### Real Estate

MONROVIA house, 3 bd., 1.75 ba., 1,559 sq. ft., raised hearth stone frplc., lots of custom oak cabinets, master suite w/dressing area/ vanity, only 12 yrs old, new paint. 952-6007.  
PASADENA townhouse, great loc. betw. S. Lake Ave. / Caltech, 2 bd., 2.5 ba., + office or den, wood-burning fireplace, security gate & priv. 2-car gar., laundry in unit, patio, vw. of garden & beautiful tree-lined st., \$389,000. 626/844-4670, Sandie or sandiesz@pacbell.net.  
POMONA, Phillips Ranch area, nice 2-story pool home, with 3 bd., 2.5 ba., new paint, upgrades throughout, finder fee \$315K. 909/623-4063 or 726-1632, cell.

### Vacation Rentals

BALBOA ISLAND, fully furn., 2 bd., 1 ba., slps. 4, dishwasher, microwave, TV, covered patio, parking, laundry facilities, steps to bay, quiet location, available weekly during the summer, \$1,200-\$1,500/week. 626/351-9641.  
BIG BEAR LAKEFRONT, luxury town home, 2 decks, tennis, pool/spa, beautiful master bd. suite, sleeps 6. 949/786-6548.  
HAWAII, Kona, ocean front on Keauhou Bay, house & guest house comfortably slp. 6, 3 bd., 2 ba.; rustic, relaxing, beautiful; swim-ming, snorkeling, fishing, spectac. view, near restaur., golf, other attractions. 626/584-9632.  
HAWAII, Maui condo, NW coast, ocean front view, 25 ft. fr. surf, 1 bd w/loft, compl. furn., phone, color TV, VCR, microwave, d/w, pool, priv. lanai, slps 4, laundry fac., 4/15-12/14 \$105/nite/2, 12/15-4-14 \$120/nite/2, \$15/nite/ add'l person. 949/348-8047, jackandrandy@cox.net.  
MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, sleeps 6-8, fully equipped kitchen incl. micro-wave, D/W, cable TV, VCR, phone, balcony w/view to mtns., Jacuzzi, sauna, streams, fish-ponds, close to Mammoth Creek, JPL discount. 626/798-9222 or 626/794-0455.  
OCEANSIDE condo, fully furn., 2 bd., 2 ba., fireplace, full kitch., quiet, relaxing, beautiful beachside setting; BBQ, pool, spa, game rm., great ocean view, easy walk to pier & restaurants, slps 8, avail. weekly or monthly. 909/ 981-7492 or dfhauge@yahoo.com, Darlene.  
OCEANSIDE, on the sand, charming 1 bd. condo, panoramic vw., walk to pier & harbor, pool/spa, game rm., sleeps 4. 949/786-6548.  
PUERTO VALLARTA, Villa del Mar, lg. studio, sleeps 4 max, rms have microwave, kitch., phones, cable TV, priv. patio; 3 pools, 3 restaur., spa, priv. beach, charming town, top-rated resort; avail only 12/28/02 - 1/4/03, on-site New Year's Eve Fiesta, see at http://www.myyucv.com/puerto\_vallarta.shtm. 541-1340.  
ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906.